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The block diagram illustrates the system architecture. A dashed box labeled 11 encloses the main processing components: a Product Equivalent Store (14), a Price Difference Calculator (15), a Price Diff. Buff. (16), a Digital Display (17), a UPC Scanner (13), a UPC Data Store (19), and a UPC Data Buffer (20). A Printer (18) is connected to the system but is located outside the dashed box. The flow of data is as follows:
 

- Input 12 (represented by a barcode) is scanned by the UPC Scanner (13).
- The UPC Scanner (13) sends data to the Product Equivalent Store (14) and the UPC Data Store (19).
- The Product Equivalent Store (14) sends data to the Price Difference Calculator (15).
- The UPC Data Store (19) sends data to the Price Difference Calculator (15) and the UPC Data Buffer (20).
- The Price Difference Calculator (15) sends data to the Price Diff. Buff. (16).
- The Price Diff. Buff. (16) sends data to the Digital Display (17) and the Printer (18).
- The UPC Data Buffer (20) sends data to the Printer (18).
- Input 21 (Product ID and Price Input) is fed into the Price Difference Calculator (15).

The present invention relates to a method for using a point-of-sale terminal to provide promotional messages during the checkout of products. The first step involves scanning, via scanner (15), a machine-readable code on a product to be purchased and generating a signal representing said code on the product to be purchased. This signal is then used to retrieve the price of the product from a first memory (19). This signal is also used to identify a product which is equivalent to the product to be purchased and to retrieve the price of the equivalent product from a second memory (14). The price retrieved from the second memory (14) is then subtracted from the price retrieved from the first memory (19) to derive a price difference. Finally, the price difference is displayed on a display means (17). This price difference may then be used by a consumer to decide if the equivalent product is a better value than the product he intended to purchase.

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POINT-OF-SALE TERMINAL ADAPTED TO PROVIDE  
PRICING INFORMATION FOR SELECTED PRODUCTS

FIELD OF THE INVENTION

5           The invention relates to product merchandising and, more particularly, to systems that promote products which are less expensive equivalents to products selected for purchase by a consumer.

BACKGROUND OF THE INVENTION

10           Checkout systems in widespread use in supermarkets and other stores typically include a "point-of-sale" (POS) terminal which is adapted to scan a Universal Product Code (UPC) bar code symbol and send digital data indicative of the code to a computer, which uses the product code data to access the product identification and price from a memory unit. The  
15           accessed product identification and/or price data may then be displayed in a digital display window or downloaded to a printer to provide a paper copy of a customer's purchase. If multiple items are purchased, the price of each item may be stored in a memory buffer and a total price for all items purchased may be calculated and displayed.

20           It is of interest to supermarkets and their operators to provide promotional messages to shoppers. While advertising in the mass media (i.e., newspapers and television) is useful, it is also advantageous to provide an individual customer with a promotional message which is tailored to his needs and/or situation, and explains why he should shop at a specific  
25           supermarket or chain of supermarkets. Such promotional messages are most

easily provided at a supermarket checkout counter, where an individual shopper's purchases may be monitored and promotional messages related to those purchases may be provided.

POS terminals which are adapted to provide promotional messages in response to specific purchases by customers are known. For example, U.S. 4,833,308, issued to Humble on May 23, 1989, discloses a point-of-sale checkout system which provides information about product promotions in response to a customer's purchases, similar to that shown in Fig. 1. POS terminal 1 features a UPC bar code scanner 3 which scans a UPC code 2 on a purchased product and generates a digital signal representing the scanned code. The digital signal is transmitted from scanner 3 to UPC data store 7, which is a computer-implemented look-up table correlating product description and price to the scanned UPC code. The correct product description and price are transmitted to a UPC data buffer 8 for temporary storage, and then to display unit 6. Meanwhile, the digital signal from the UPC scanner is also transmitted to a UPC purchase categorizer 4, which compares the UPC signal to a set of UPC codes stored in the categorizer's memory. If the UPC signal matches a UPC code stored in categorizer 4, it indicates that a promotional plan relating to the purchased product is underway. Categorizer 34 then identifies the promotional plan in question, and sends a signal relating to that promotional plan to a categorized message store 5. Store 5 recalls a set of promotional messages relating to that promotional plan and sends them to display unit 6. Similar systems are described by Humble in U.S. 4,825,045 and Weinblatt in U.S. 5,515,270.

Osawa, in Japanese patent 04-157298, discloses a cash register

which provides promotional messages. When a merchandise code is input to the system, the system determines whether the product corresponding to that code will be put on sale on a specified day. If so, a promotional message announcing the upcoming sale is printed on the customer's receipt.

5           The systems described in the patents listed above, the disclosures of which are incorporated by reference herein, have the disadvantage of requiring individual promotional messages for each product, forcing a store manager to alter the stored promotional messages each time a price changes. It would be of interest to provide a system which uses only a single  
10       generic message which is altered in response to an individual customer's purchases.

          Additionally, more and more supermarkets are preparing and selling food under their own name. As these "house brands" become more ubiquitous, supermarkets are becoming interested in promoting sales of an  
15       entire line of items, rather than simply individual items.

          It is an first object of the present invention to provide a point-of-sale checkout system which provides useful promotional messages while relieving the sales staff of the burden of regularly entering different promotional  
20       messages.

          It is an second object of the present invention to provide a point-of-sale checkout system which is useful for promoting a series of selected items.

#### SUMMARY OF THE INVENTION

          The present invention relates to a method for providing promotional  
25       messages during the checkout of products. The method involves the use of a

system adapted to read UPC codes or other machine-readable product codes on products.

The first step in the present method involves scanning a machine-readable code on a product to be purchased and generating a signal  
5 representing said code on the product to be purchased. This signal is then used to retrieve the price of the product from a first memory. This signal is also used to identify a product which is equivalent to the product to be purchased and retrieve the price of the equivalent product from a second memory. Two products are judged to be equivalent if they are essentially  
10 identical, except for being sold under different brand names. For example, a supermarket may judge a national brand of puffed wheat cereal to be equivalent to the supermarket's own brand of puffed wheat cereal.

The next stage in the process involves subtracting the price retrieved from the second memory from the price retrieved from the first memory to  
15 derive a price difference. Finally, the price difference is displayed on a display means. Usually, the price retrieved from the first memory will also be displayed on the display means.

The invention is also directed toward an apparatus adapted to carry  
20 out the described process.

#### DESCRIPTION OF DRAWINGS

Fig. 1 illustrates a previously known point-of-sale checkout system which give promotional information.

Fig. 2 illustrates a first embodiment of the point-of-sale checkout  
25 system of the current invention.

Fig. 3 is a flow chart, illustrating how the system shown in Fig. 2 acts on data received from the scanner 13.

Figs. 4, 5, and 6 illustrate additional embodiments of the point-of-sale checkout system of the current invention

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#### DETAILED DESCRIPTION OF THE INVENTION

A first embodiment of the current invention is illustrated in Fig. 2. The checkout system 11 is intended for use in a supermarket or other store, and includes a product code scanner 13 which may be used to scan a machine-  
10 readable product code 12, such as a UPC bar code, on a product to be purchased.

Scanner 13 generates a signal representing the scanned product code 12, and transmits the signal to a first memory section 19 and to a second memory section 14.

15 The first memory section 19 is a computer-implemented look-up table of known configuration. Memory section 19 stores the product codes of all items offered for sale in the store. Each product code stored in memory section 19 is correlated with a predetermined product price. Preferably, each product code stored in memory section 19 is correlated with both a product  
20 description and a predetermined product price. When a signal representing a scanned product code 12 is received from scanner 13 by memory section 19, memory section 19 compares the product code represented by the signal (i.e., the scanned product code 12) to each product code stored in memory section 19, and identifies a stored product code which is identical to scanned  
25 product code 12. The identified product code stored in memory section 19 is

then used to retrieve a predetermined product price which is correlated to the identified product code and, if applicable, a product description, also correlated to the identified product code, from memory section 19. Memory section 19 then generates a signal representing the retrieved product price and the retrieved product description and transmits this signal to a first data buffer, where the retrieved product price and the retrieved product description are stored temporarily. Memory section 19 also sends a signal representing the retrieved product price to a calculator circuit 15 which will be discussed later.

Second memory section 14 is also a computer-implemented look-up table which stores the product codes of selected items offered for sale in the store. Each product code stored in memory section 14 is correlated, not with a price as in memory section 19, but with at least one different product code which codes for a product which is essentially identical to the product to be purchased (hereinafter referred to as an equivalent product code). Each equivalent product code stored in memory section 14 is in turn correlated with the price of the essentially identical, or equivalent, product (hereinafter referred to as an equivalent product price).

Typically, an operator will determine that two products are equivalent if they differ only in a manner which is essentially unrelated to their structure or function, such as brand name. For example, an operator working at a Savemart supermarket might determine that a product code identifying Kellogg's Rice Krispies is equivalent to a product code identifying SaveMart's house brand of Crisped Rice. This checkout system would also be of value to drugstores and pharmacies, as it might be used to alert customers that



generic versions of brand name pharmaceuticals are available. For example, a pharmacist might identify a generic version of the anticonvulsant drug valproic acid as equivalent to Depakote, manufactured by Abbott Laboratories.

5           Returning to Fig.2, when a signal representing a scanned product code 12 is received from scanner 13 by memory section 14, memory section 14 compares the product code represented by the signal to each product code stored in memory section 14, and identifies a product code stored in memory section 14 which is identical to scanned product code 12. The identified  
10           product code stored in memory section 14 is then used to retrieve the equivalent product code which is correlated to the identified product code from memory section 14. The equivalent product code retrieved from the memory section 14 is then used to retrieve an equivalent product price from memory section 14, where the retrieved equivalent product price is correlated  
15           to the previously retrieved equivalent product code. Memory section 14 then generates a signal representing the retrieved equivalent product price. The signal representing the retrieved equivalent product price is transmitted to calculator circuit 15.

          Calculator circuit 15 receives (a) the signal representing the retrieved  
20           product price from memory means 19 and (b) the signal representing the retrieved equivalent product price from memory means 14. Circuit 15 then uses these signals to subtract the retrieved equivalent product price from the retrieved product price to derive a price difference, and generates a signal representing the derived price difference. The signal representing the derived  
25           price difference is then sent to a second data buffer 16, where the derived

price difference is temporarily stored.

Upon receiving a signal sent by the operator of the checkout system 11, a signal representing the product price and product description data stored in the first data buffer is sent from the first data buffer to a display means. Similarly, a signal representing the derived price difference stored in the second data buffer is sent from the second data buffer to the display means. The display means uses the signals to display the price of the product to be purchased, a description of the product to be purchased, and the amount of money that the customer would save by purchasing a product which is essentially equivalent to the product to be purchased (that is to say, by buying a product identified by the second memory section as equivalent to the product which was actually selected to be purchased). The display means may be a digital display 17, a printer 18, or both. It is also possible to connect a synthetic speech generator to (not shown) buffer 16, so that an audible announcement of possible savings may be provided. Pointof-sale terminals having synthetic speech generators are known in the art; see, for example, U.S. patent 4,348,551, the disclosure of which is incorporated by reference herein.

Typically, a supermarket will use this system to promote its own line of merchandise. The supermarket will then correlate the product code on a item sold by a national brand to a product code on an item prepared and sold by the supermarket (the equivalent product code), and the correlated product codes are entered in memory unit 14. The price of the supermarket's item is then correlated to the equivalent product code entered in memory unit 14. If a customer selects the national brand item for purchase, the product code on

the national brand item is used to retrieve the price of the national brand item from the first memory means and to retrieve the price of the supermarket brand item from the second memory means, in the manner described above. The price of the supermarket brand item is subtracted from the price of the national brand item, and the resulting difference is transmitted, through buffer 16, to a display means, where a message announcing the amount of money to be saved by purchasing the supermarket brand item is displayed. Since items marketed directly by supermarkets are normally less expensive than national brand items, this provides the customer an incentive to purchase the supermarket brand item.

It is possible that a product having a code stored in memory unit 14 will not have an equivalent product. This may occur because there truly is no product readily identified as equivalent. Alternatively, an operator may elect not to identify two products as being equivalent. For example, if an operator intends to promote a supermarket's house brand items, a house brand item which is equivalent to a national brand item may be correlated to the equivalent national brand item in memory unit 14 only if it is less expensive than the national brand item. If the house brand item is not less expensive than the national brand item, the operator may elect not to correlate the two. In either of these circumstances, memory unit 14 may not be able to correlate an equivalent product code to a scanned product code 12.

This situation may be handled by providing the checkout system 14 with a CPU (not shown in Fig. 2) which determines how to proceed in response to output from memory unit 14 and/or calculator 15, as shown in the flow chart in Fig. 3. When a signal representing a scanned code 12 arrives

from scanner 13, storage unit 14 attempts to correlate code 12 to the product code of an equivalent product (step S1). If the CPU determines that an equivalent product code has been identified by memory unit 14, the price of the equivalent product will be retrieved from memory unit 14 and sent to  
5 calculator circuit 15. There, it will be subtracted from the price of the product to be purchased, as previously described (step S2). If the CPU determines that an equivalent product code has not been found by memory unit 14, the process of determining a price difference is simply aborted at this stage (step S3). Note that the process of recalling a product identification and price from  
10 memory unit 19 and sending this to a display means through buffer 20, which does not require data retrieved from memory unit 14, may proceed normally.

The price difference is then calculated by subtracting the equivalent product price from the price of the product to be purchased in calculator circuit 15. The CPU may then make a decision on how to proceed based on  
15 the sign of the calculated price difference. If the price difference is positive, indicating that the equivalent product is less expensive than the purchased product, the CPU signals calculator 15 to transmit the price difference to buffer 16 (step S4). The price difference is then displayed as part of a message announcing the amount to be saved by buying equivalent products  
20 (For example, in a pharmacy, the system might display a message announcing "BUY GENERIC DRUGS AND SAVE \$ (insert price difference here)."). If the price difference is negative, transmission of the price difference to the buffer is aborted (step S5).

If multiple items are purchased, checkout system 11 may be used on  
25 each item sequentially. The product code on a first product is scanned and

used to retrieve a first set of product price and description data from memory section 19 and store the first set of retrieved product price and description data in buffer 20, as described above. The product code on the first product is also used to retrieve the price of a product which is equivalent to the first product from memory section 14 and derive a first price difference between the price of the first product and the first equivalent product price. The first price difference is stored in buffer 16. The product code on a second product may then be scanned and used to retrieve a second set of product price and description data from memory section 19 and store the second set of retrieved product price and description data in buffer 20. The product code on the second product is also used to retrieve the price of a product which is equivalent to the second product from memory section 14, derive a second price difference between the price of the second product and the second equivalent product price, and store the second price difference in buffer 16. This may be repeated for additional products. When the checkout system has been used on all items to be purchased, all price differences stored in buffer 16 may be recalled in response to a signal from an operator and added to provide a total price difference. Similarly, the prices of all items purchased may be recalled from buffer 20 to generate a total purchase price. The total purchase price and/or the total price difference may then be displayed.

Product price and/or identification information is provided to memory sections 14 and 19 by a price input means 21. There is no need to provide a series of promotional messages stored in a special memory means, since the output message, giving potential monetary savings, is automatically tailored to an individual customer's specific purchase.

Fig. 4 shows a second, slightly different embodiment of the invention.

The elements which are common to the first and second embodiments are identically numbered. The design and operation of the second embodiment of the checkout system is essentially identical to that of the first embodiment, with the following differences. The signal representing the scanned product code 12 on the product to be purchased is transmitted only to the first memory section 19, and not to the second memory section 14. When the signal representing a scanned product code 12 is received from scanner 13 by memory section 19, memory section 19 compares the product code represented by the signal to each product code stored in memory section 19, and identifies a stored product code which is identical to scanned product code 12. A signal representing the identified product code is then sent to second memory section 14. When the signal representing the identified product code is received from first memory section 19 by memory section 14, memory section 14 compares the product code represented by the signal to each product code stored in memory section 14, and identifies a product code stored in memory section 14 which is identical to the identified product code. Meanwhile, the identified product code stored in memory section 19 is used to retrieve a predetermined product price and, if applicable, a product description. The identified product code stored in memory section 14 is used to retrieve the price of a product which is equivalent to the product to be purchased. All subsequent steps are performed exactly as previously described.

A third embodiment illustrated in Fig. 5 is adapted to display the price of an object to be purchased, the price of an object which is equivalent to the

object to be purchased, and the difference between the two prices. Again, components which are essentially identical to those in the previously described first embodiment are identically numbered. The third embodiment differs from the first embodiment primarily in that second data buffer 16 for storing derived price differences has been replaced with third data buffer 32. 5 The third data buffer receives and stores the signal representing the retrieved equivalent product price from memory section 14, where the signal from memory section 14 is generated as previously described. The retrieved equivalent product price is then downloaded to a display means, which may 10 be a digital display or a printer, upon receipt of a command from the operator. Data buffer 20 stores price and product identification information relating to the product to be purchased, and downloads this information to the display means upon receipt of a command from the operator. Calculator circuit 15 is adapted to receive a signal identifying the equivalent product price stored in 15 data buffer 32 and a signal indicating the price of the product to be purchased from data buffer 20. The calculator circuit determines the difference between the equivalent product price and the price of the product to be purchased, stores this information, and downloads it to the display means upon receipt of a signal from the operator. The display means then displays the downloaded 20 information.

Other embodiments of this invention are contemplated. For example, checkout system 41 having only a single memory is shown in Fig. 6. In this system, after a product code 12 is scanned by scanner 13, a signal representing the scanned product code is sent to a single, unified memory 25 unit 42. Memory unit 42 is a computer-implemented look-up table of known

configuration which stores the product codes of all items offered for sale in the store. Each product code is correlated with a description, a price, and, if applicable, the product code of an equivalent product. When a signal representing a scanned product code 12 is received from scanner 13 by  
5 memory unit 42, memory unit 42 compares the product code represented by the signal to each product code stored in memory unit 42, and identifies a stored product code which is identical to scanned product code 12. The identified product code is then used to retrieve the description and price which are correlated to the identified product code. A signal representing the  
10 retrieved price and description is then sent to buffer 20, and also to calculator circuit 15 through line 45. The identified product code is then used to retrieve the product code of an equivalent product, if any. Memory unit 42 then uses the product code of an equivalent product to retrieve the price of the equivalent product, in the same manner that the price of the scanned product  
15 was retrieved. The equivalent product price is sent to circuit 15 through line 44. Circuit 15 subtracts the price received through line 44 from the price received through line 45, and sends the result to the display unit 43 through buffer 16. Meanwhile, the price of the product to be purchased is downloaded to display unit 43 through buffer 20.

20 The system has been described as being designed to show how much could be saved by buying equivalent, but less expensive products. With minor modifications, it could be adapted to tell how much has been saved by buying the selected products instead of more expensive alternative products. This can be done by correlating product codes stored in memory unit 14 of  
25 Fig. 2 with the product codes of more expensive equivalent products.



Memory unit 14 sends the price of the more expensive equivalent product to calculator 15, which subtracts the price of the product actually purchased (received from memory unit 19) to generate a price difference, which is displayed as the amount of money saved.

5           Alternatively, memory unit 19 could be adapted to send the price per unit weight of a selected product to calculator 15. Memory unit 14 would then send the price per unit weight of a different size of the same product to calculator 15. Calculator 15 would then determine the difference between the two prices per unit weight, and display the result. This would let the customer  
10           know if he or she could receive a better value by purchasing a larger or smaller size of the product.

          The system of Fig. 4 could also be used to provide data on savings to be obtained by shopping with a particular credit card. When a purchase is made, a determination is made whether the shopper is using a credit card  
15           that offers price discounts. If not, memory section 19 recalls the non-discounted retail price and sends it to data buffer 20. The non-discounted price is also sent to calculator circuit 15. A signal is sent to memory unit 14, identifying the product to be purchased. Memory 14 retrieves a discounted price obtained by shopping with said particular credit card, and sends the  
20           discounted price to calculator 15. Calculator 15 subtracts the discounted price from the non-discounted price to determine the savings obtained by using the particular credit card. The difference is then sent to a display unit through buffer 16. The non-discounted price is sent from buffer 20 to the display unit. If a purchase is made using the particular credit card, all steps  
25           involving operations performed by memory unit 14, calculator circuit 15, and

buffer 16 are cancelled.

**SUBSTITUTE SHEET (RULE 26)**

## WHAT IS CLAIMED IS:

1) A method for providing promotional messages during the checkout of products, comprising the steps of:

5 a) storing prices of predetermined products and product codes in a first memory means, wherein each predetermined product price is correlated with a specific product code stored in the first memory means;

b) storing product codes in a second memory means, wherein each product code stored in the second memory is correlated to a product code for an equivalent product, and wherein each product code for an  
10 equivalent product is correlated to an equivalent product price;

c) detecting a product code on an article to be purchased;

d) comparing the detected product code to the product codes stored in the first memory and identifying a product code stored in the first memory which is identical to the detected product code;

15 e) retrieving a predetermined product price which is correlated to the identified product code stored in the first memory;

f) comparing the detected product code to the product codes stored in the second memory and identifying a product code stored in the second memory which is identical to the detected product code;

20 g) retrieving a product code for an equivalent product which is correlated to the identified product code stored in the second memory, and then retrieving the equivalent product price which is correlated to the retrieved product code for an equivalent product;

25 h) subtracting the retrieved equivalent product price obtained in step (g) from the retrieved predetermined product price obtained in step (e) to

derive a price difference; and

i) displaying the predetermined product price retrieved in step (e)

and, if the price difference derived in step (h) is greater than zero, a message reporting the price difference.

5        2) A method for providing promotional messages during the checkout of products, comprising the steps of:

a) storing prices of predetermined products and product codes in a first memory means, wherein each predetermined product price is correlated with a specific product code stored in the first memory means;

10        b) storing product codes in a second memory means, wherein each product code stored in the second memory is correlated to a product code for an equivalent product, and wherein each product code for an equivalent product is correlated to an equivalent product price;

c) detecting a product code on an article to be purchased;

15        d) comparing the detected product code to the product codes stored in the first memory and identifying a product code stored in the first memory which is identical to the detected product code;

e) retrieving a predetermined product price which is correlated to the identified product code stored in the first memory from the first memory;

20        f) comparing the identified product code stored in the first memory to the product codes stored in the second memory and identifying a product code stored in the second memory which is identical to the identified product code stored in the first memory;

25        g) retrieving said product code for an equivalent product which is correlated to the identified product code stored in the second memory, and

retrieving the equivalent product price which is correlated to the retrieved product code for an equivalent product;

h) subtracting the retrieved equivalent product price obtained in step (g) from the retrieved predetermined product price obtained in step (e) to  
5 derive a price difference; and

i) displaying the predetermined product price retrieved in step (e) and, if the price difference derived in step (h) is greater than zero, a message reporting the price difference.

3) A method for providing promotional messages during the checkout of  
10 products, comprising the steps of:

a) storing prices of predetermined products and product codes in a first memory means, wherein each predetermined product price is correlated with a specific product code stored in the first memory means;

b) storing product codes in a second memory means, wherein  
15 each product code stored in the second memory is correlated to a product code for an equivalent product, and wherein each product code for an equivalent product is correlated to an equivalent product price;

c) detecting a product code on a article to be purchased;

d) comparing the detected product code on the article to the  
20 product codes stored in the first memory and identifying a product code stored in the first memory which is identical to the detected product code on the article;

e) retrieving a predetermined product price which is correlated to the identified product code stored in the first memory from the first memory  
25 and storing the retrieved predetermined product price in a first data buffer;

f) comparing the detected product code on the article to the product codes stored in the second memory and identifying a product code stored in the second memory which is identical to the detected product code on the article;

5 g) retrieving a product code for an equivalent product which is correlated to the identified product code stored in the second memory, and retrieving the equivalent product price which is correlated to the retrieved product code for an equivalent product;

10 h) storing the retrieved equivalent product price in a second data buffer;

i) subtracting the retrieved equivalent product price stored in the second data buffer from the retrieved predetermined product price stored in the first data buffer to derive a price difference; and

15 j) displaying the predetermined product price stored in the first data buffer, the equivalent product price stored in the second data buffer, and a message reporting the price difference.

4) A method for providing promotional messages during the checkout of products, comprising the steps of:

20 a) storing prices of predetermined products and product codes in a first memory means, wherein each predetermined product price is correlated with a specific product code stored in the first memory means;

25 b) storing product codes in a second memory means, wherein each product code stored in the second memory is correlated to a product code for an equivalent product, and wherein each product code for an equivalent product is correlated to an equivalent product price;

- c) detecting a product code on a article to be purchased;
- d) comparing the detected product code on the article to the product codes stored in the first memory and identifying a product code stored in the first memory which is identical to the detected product code on the article;
- 5 e) retrieving a predetermined product price which is correlated to the identified product code stored in the first memory from the first memory and storing the retrieved predetermined product price in a first data buffer;
- f) comparing the detected product code on the article to the product codes stored in the second memory and identifying a product code stored in the second memory which is identical to the detected product code on the article;
- 10 g) retrieving a product code for an equivalent product which is correlated to the identified product code stored in the second memory, and retrieving the equivalent product price which is correlated to the retrieved product code for an equivalent product;
- 15 h) subtracting the retrieved equivalent product price stored in the second data buffer from the retrieved predetermined product price stored in the first data buffer to derive a price difference, and storing the price difference in a second data buffer; and
- 20 i) displaying the predetermined product price stored in the first data buffer and a message reporting the price difference stored in the second data buffer.
- 5) A system for providing promotional messages during the checkout of products, comprising:
- 25

a) a first memory means for storing prices of predetermined products and product codes, wherein each predetermined product price stored in the first memory means is correlated with a specific product code;

5 b) a second memory means for storing product codes, wherein each product code stored in the second memory means is correlated to a product code for an equivalent product, and wherein each product code for an equivalent product is correlated to an equivalent product price;

10 c) a means for detecting a product code on a product to be purchased and generating an output signal representative of the detected product code;

15 d) a means for receiving the detecting means output signal, comparing the detected product code represented by the detecting means output signal to the product codes stored in the first memory, and identifying a product code stored in the first memory which is identical to the detected product code;

e) a means for retrieving a predetermined product price which is correlated to the identified product code stored in the first memory from the first memory and generating a signal representing the retrieved predetermined product price;

20 f) a means for receiving the detecting means output signal, comparing the detected product code represented by the detecting means output signal to the product codes stored in the second memory, and identifying a product code stored in the second memory which is identical to the detected product code;

25 g) a means for retrieving a product code for an equivalent product



which is correlated to the identified product code stored in the second memory from the second memory, retrieving the equivalent product price which is correlated to the retrieved product code for an equivalent product from the second memory, and generating a signal representing the retrieved equivalent product price;

h) a calculating means for receiving the signal representing the retrieved predetermined product price, receiving the signal representing the retrieved equivalent product price, subtracting the retrieved equivalent product price from the retrieved predetermined product price to derive a price difference, and generating a signal representing the derived price difference; and

i) a display means for receiving the signal representing the derived price difference and displaying the derived price difference.

6) The system of claim 5, where the display means is a digital display screen.

7) The system of claim 5, where the display means is a printer.

8) The system of claim 5, where the display means is adapted to:

i) receive the signal representing the retrieved predetermined product price;

ii) display the retrieved predetermined product price;

iii) receive the signal representing the derived price difference; and

iv) display the derived price difference.

9) A system for providing promotional messages during the checkout of products, comprising:

a) a first memory means for storing prices of predetermined

products and product codes, wherein each predetermined product price stored in the first memory means is correlated with a specific product code;

b) a second memory means for storing product codes, wherein each product code stored in the second memory means is correlated to a product code for an equivalent product, and wherein each product code for an equivalent product is correlated to an equivalent product price;

c) a means for detecting a product code on a product to be purchased and generating an output signal representative of the detected product code;

d) a means for receiving the detecting means output signal, comparing the detected product code represented by the detecting means output signal to the product codes stored in the first memory, and identifying a product code stored in the first memory which is identical to the detected product code;

e) a means for retrieving a predetermined product price which is correlated to the identified product code stored in the first memory from the first memory;

f) a first data buffer for storing the retrieved predetermined product price temporarily and generating a signal representing the retrieved predetermined product price at a desired time;

g) a means for receiving the detecting means output signal, comparing the detected product code represented by the detecting means output signal to the product codes stored in the second memory, and identifying a product code stored in the second memory which is identical to the detected product code;

h) a means for retrieving a product code for an equivalent product which is correlated to the identified product code stored in the second memory from the second memory and retrieving the equivalent product price which is correlated to the retrieved product code for an equivalent product  
5 from the second memory;

i) a second data buffer for storing the retrieved equivalent product price temporarily, and generating a signal representing the retrieved equivalent product price;

j) a calculating means for receiving the signal representing the  
10 retrieved predetermined product price, receiving the signal representing the retrieved equivalent product price, subtracting the retrieved equivalent product price from the retrieved predetermined product price to derive a price difference;

k) a display means for receiving the signal representing the derived  
15 price difference and displaying the derived price difference.

10) The system of claim 9, where the display means is adapted to:

i) receive the signal representing the retrieved predetermined product price;

ii) display the retrieved predetermined product price;

20 iii) receive the signal representing the retrieved equivalent product price;

iv) display the retrieved equivalent product price;

v) receive the signal representing the derived price difference; and

vi) display the derived price difference.

25 11) The system of claim 9, where the display means is a digital display

screen.

12) The system of claim 9, where the display means is a printer.

13) A system for providing promotional messages during the checkout of products, comprising:

5           a) a means for scanning a machine-readable code on a product to be purchased and generating a signal representing said code on said product to be purchased;

          b) a means for using the signal representing said code on said product to be purchased to retrieve the price of said product to be purchased  
10       from a first memory;

          c) a means for using the signal representing said code on said product to be purchased to identify a product which is equivalent to the product to be purchased and retrieve the price of the equivalent product from a second memory;

15           d) a means for subtracting the price retrieved from the second memory from the price retrieved from the first memory to derive a price difference; and

          e) a means for displaying the price difference.

14) A method for providing promotional messages during the checkout of  
20       products, comprising the steps of:

          a) scanning a machine-readable code on a product to be purchased and generating a signal representing said code on said product to be purchased;

          b) using the signal representing said code on said product to be  
25       purchased to retrieve the price of said product to be purchased from a

memory which stores prices of products:

c) using the signal representing said code on said product to be purchased to identify a product which is equivalent to the product to be purchased and retrieve the price of the equivalent product from a memory  
5 which stores prices of equivalent products;

d) subtracting the price retrieved in step (c) from the price retrieved in step (b) to derive a price difference; and

e) displaying the price difference;

with the proviso that if no product which is equivalent to the product to  
10 be purchased can be identified, steps (d) and (e) will not be performed.

15) The method of claim 14, wherein the memory which stores prices of products is different from the memory which stores prices of equivalent products.

16) The method of claim 14, wherein the memory which stores prices of  
15 products is the same as the memory which stores prices of equivalent products.

17) The method of claim 14, with the additional proviso that if the price difference calculated in step (d) is less than or equal to zero, step (e) will not be performed.

20 18) A method for providing promotional messages during the checkout of products, comprising the steps of:

a) scanning a machine-readable code on a first product to be purchased and generating a signal representing said code on said first product to be purchased;

25 b) using the signal representing said code on said first product to

be purchased to retrieve the price of said first product to be purchased from a first memory;

5 c) using the signal representing said code on said first product to be purchased to identify a product which is equivalent to the first product to be purchased and retrieve the price of the product which is equivalent to the first product to be purchased from a second memory;

d) subtracting the price of the product which is equivalent to the first product to be purchased from the price of the first product to derive a first price difference;

10 e) scanning a machine-readable code on a second product to be purchased and generating a signal representing said code on said second product to be purchased;

f) using the signal representing said code on said second product to be purchased to retrieve the price of said second product to be purchased from the first memory;

15 g) using the signal representing said code on said second product to be purchased to identify a product which is equivalent to the second product to be purchased and retrieve the price of the product which is equivalent to the second product to be purchased from the second memory;

20 h) subtracting the price of the product which is equivalent to the second product to be purchased from the price of the second product to derive a second price difference;

i) adding the second price difference to the first price difference to derive a total price difference; and

25 j) displaying the total price difference.

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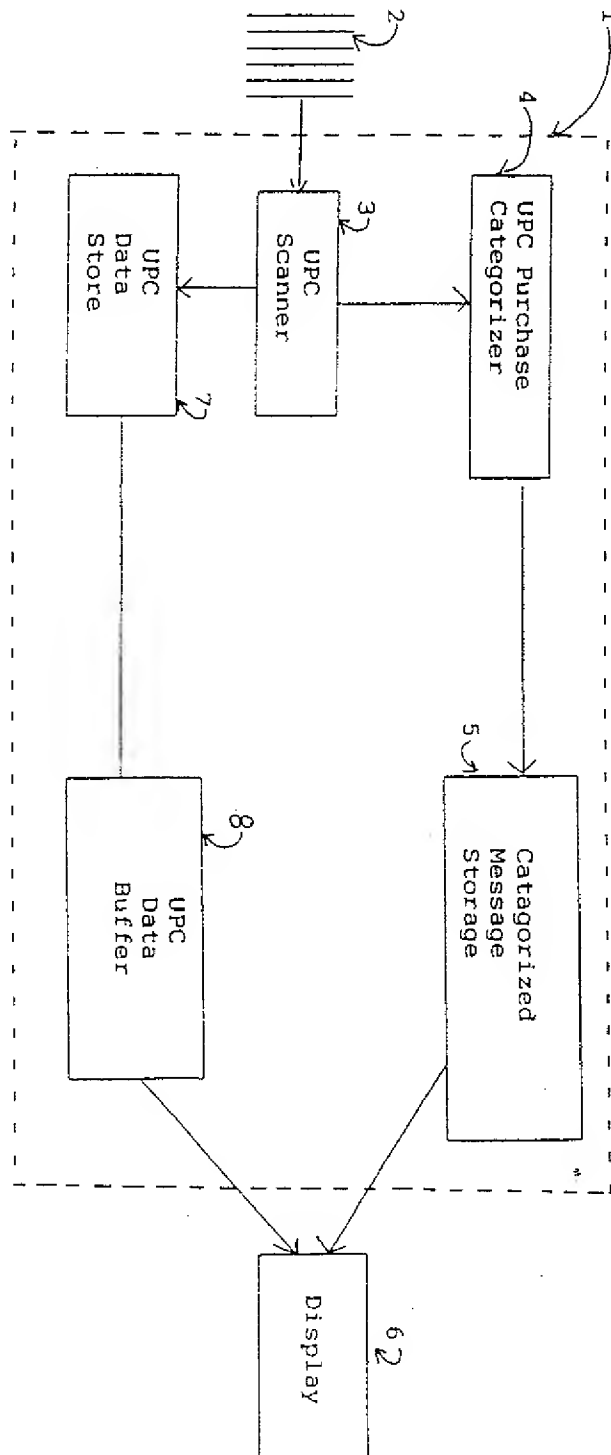


Fig. 1 Prior Art

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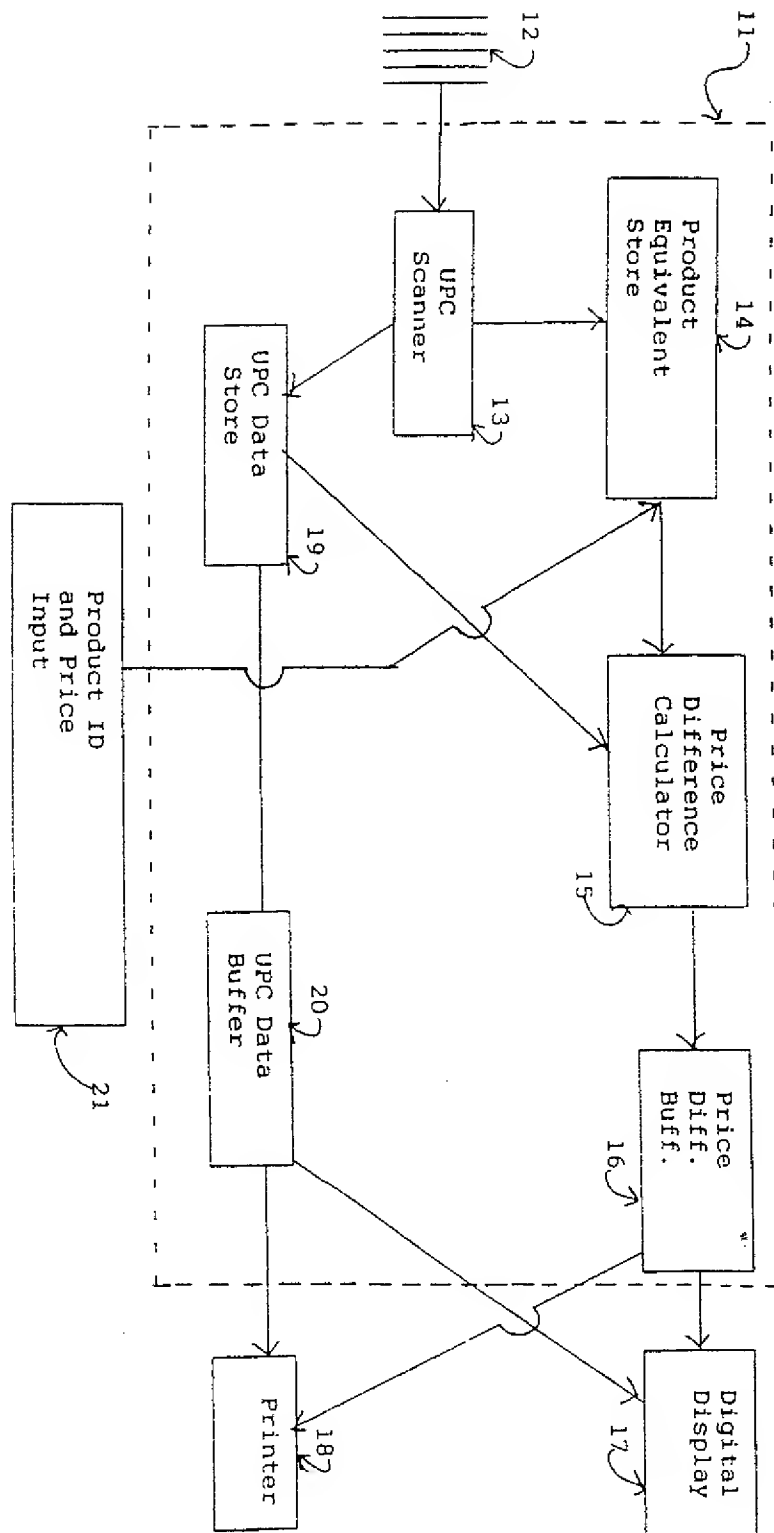


Fig. 2



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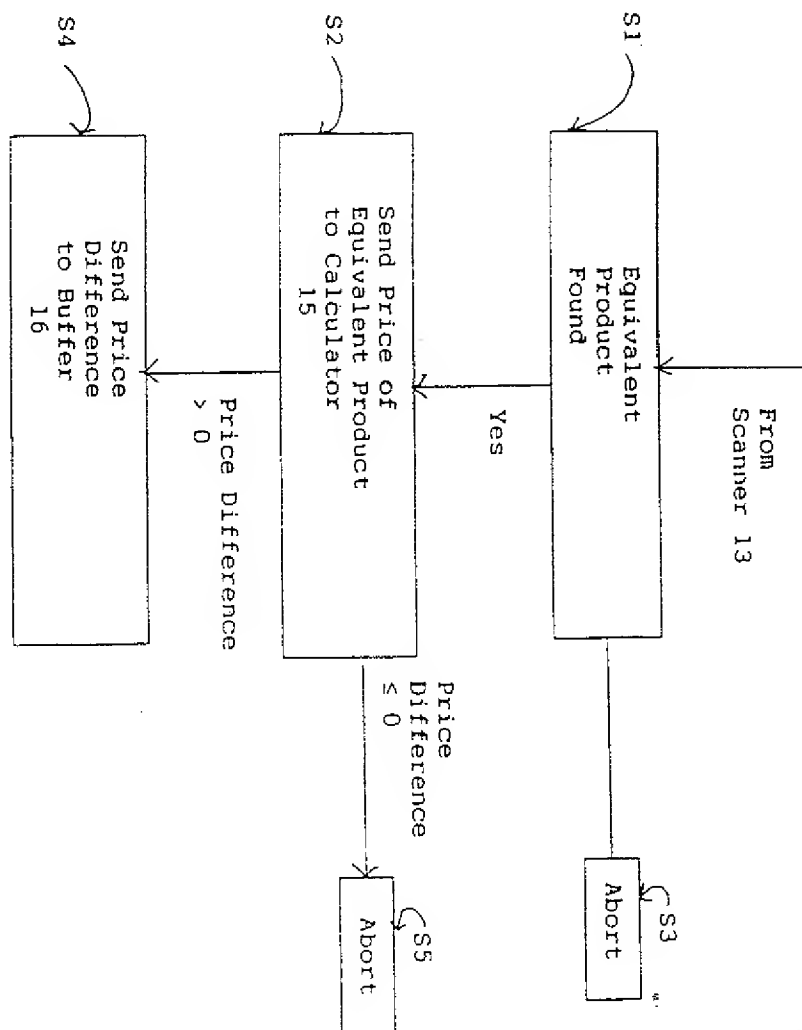


Fig. 3

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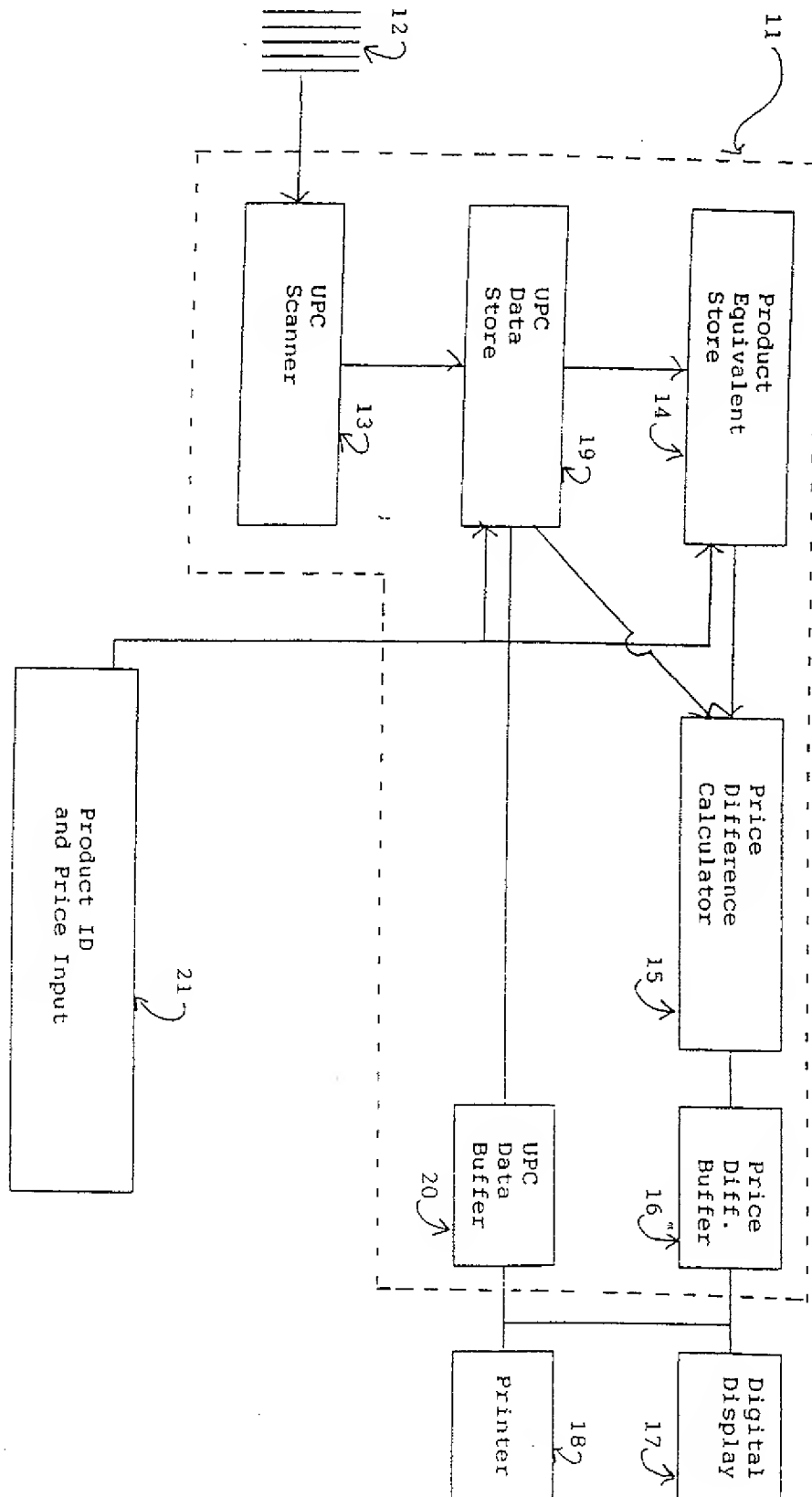


Fig. 4

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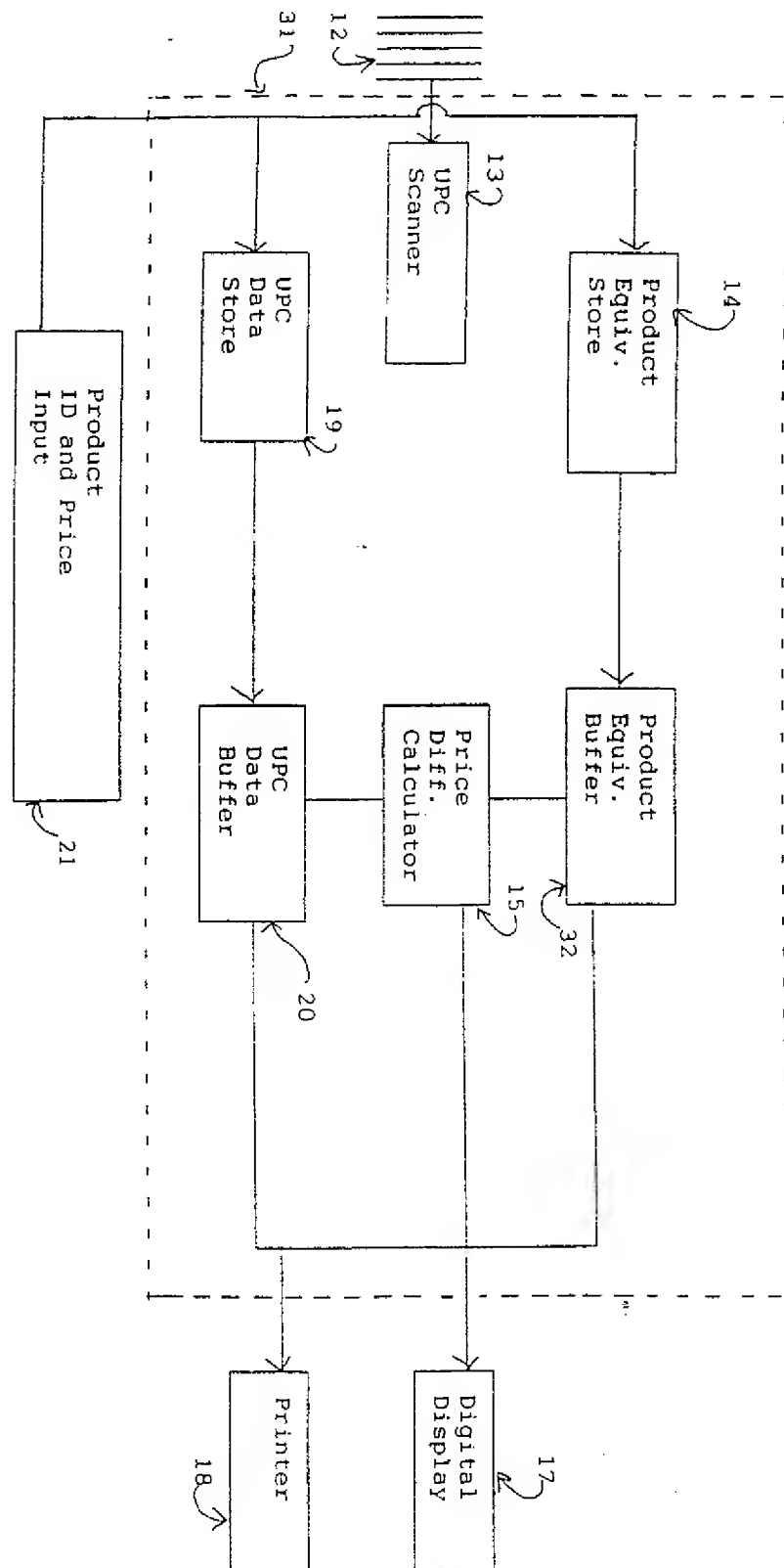


Fig. 5

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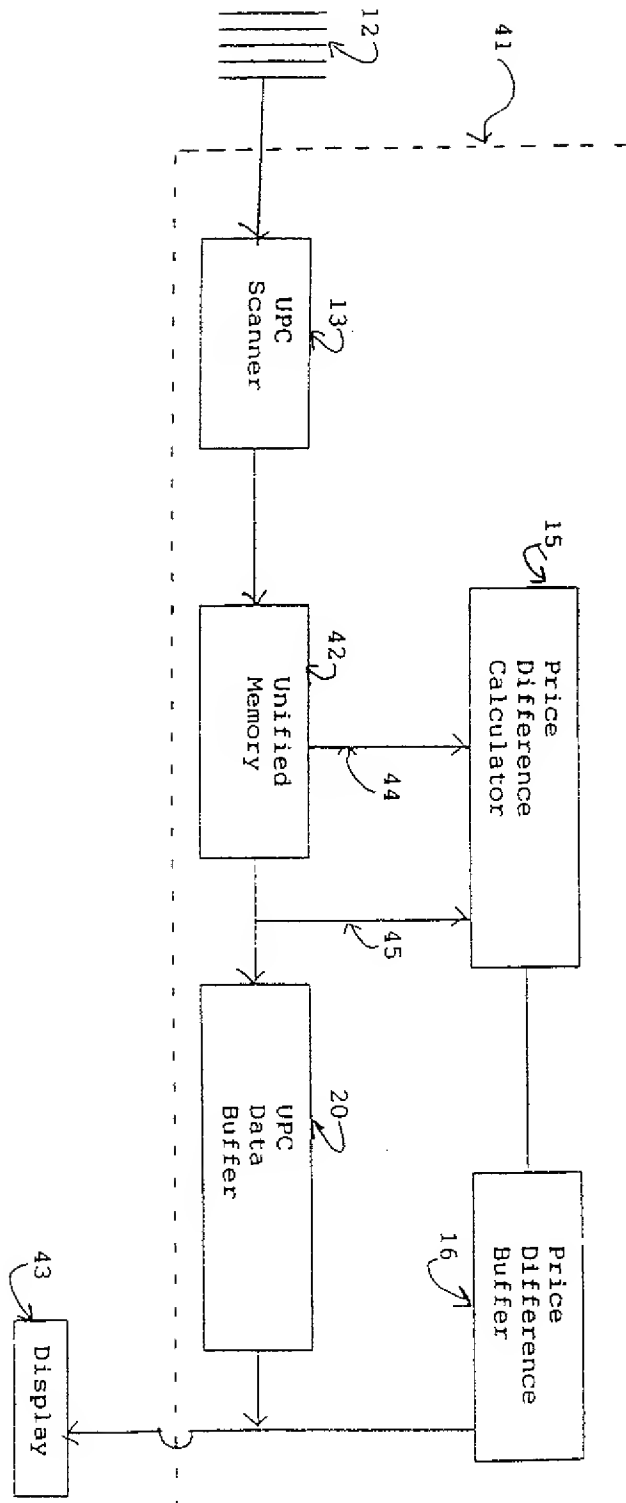


Fig. 6

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US96/13718

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G06F 17/60; 153:00

US CL : 364/401R

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 364/401R, 403, 404, 405; 235/383, 385

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,825,045 (HUMBLE) 25 April 1989, abstract, figures 1-2; col. 2, line 53 to col. 3, line 34	1-18
Y	US, A, 4,833,308 (HUMBLE) 23 May 1989, abstract, figures 1-2; col. 2, line 54 to col. 3, line 32	1-18
A	US, A, 4,872,113 (DINERSTEIN) 03 October 1989, abstract, figure 1; and col. 2, line 52 to col. 3, line 24	1-18
A	US, A, 5,083,638 (SCHNEIDER) 28 January 1992 abstract, figures 1-2, and col. 2, line 52 to col. 3, line 24	1-18

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be part of particular relevance	X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reasons (as specified)	Z*	document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means		
*P* documents published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 10 OCTOBER 1996	Date of mailing of the international search report 07 NOV 1996
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer <i>Brian A. Harden</i> ROBERT A. WEINHARDT BRIAN A. HARDEN PARALEGAL SPECIALIST GROUP 2400 Telephone No. (703) 305-9780

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US96/13718

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 5,250,789 (JOHNSEN) 05 October 1993 abstract, figures 1-3 & 6-9; col. 6, lines 53-68; col. 8, lines 24-47; col. 8, line 60 to col. 10, line 8	1-18
A	US, A, 5,295,064 (MALEC ET AL) 15 March 1994, abstract; figures 1, 4, & 9A-9B; col. 7, line 52 to col. 8, line 20; and col. 24, lines 49-56	1-18
Y	US, A, 5,361,871 (GUPTA ET AL) 08 November 1994 abstract; figures 1-4, 6, 7b-7c, 8, & 11-13; col. 2, line 67 to col. 3, line 28; col. 4, lines 52-62; col. 5, lines 5-42; col. 6, lines 3-68; col. 7, lines 36-45; col. 9, lines 20-27; col. 11, line 30 to col. 12, line 13; col. 12, lines 39-47; col. 13, lines 5-15; and col. 15, lines 23-41	1-18

Form PCT/ISA/210 (continuation of second sheet)(July 1992)\*

# INTERNATIONAL SEARCH REPORT

Int. Patent application No.  
PCT/US96/13718

## B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

APS

search terms: promotions/promotionals, checkouts, counters, prices, displays, discounts, reductions, savings

